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PTO/SB/21 (09-06)

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**TRANSMITTAL
FORM**

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

45

Application Number

10/084,704

Filing Date

02/26/2002

First Named Inventor

DEVENYI, Gabor

Art Unit

3682

Examiner Name

HANSEN, Colby

Attorney Docket Number

01W120

ENCLOSURES (Check all that apply)

Fee Transmittal Form



Fee Attached



Amendment/Reply



After Final



Affidavits/declaration(s)



Extension of Time Request



Express Abandonment Request



Information Disclosure Statement



Certified Copy of Priority Document(s)

Reply to Missing Parts/
Incomplete ApplicationReply to Missing Parts
under 37 CFR 1.52 or 1.53

Drawing(s)



Licensing-related Papers



Petition

Petition to Convert to a
Provisional Application

Power of Attorney, Revocation



Change of Correspondence Address



Terminal Disclaimer



Request for Refund



CD, Number of CD(s) _____



Landscape Table on CD



After Allowance Communication to TC

Appeal Communication to Board
of Appeals and InterferencesAppeal Communication to TC
(Appeal Notice, Brief, Reply Brief)

Proprietary Information



Status Letter

Other Enclosure(s) (please identify
below):Acknowledgement receipt postcard
Duplicate PTO/SB/17 Fee Transmittal**Remarks**

Title: Leadscrew assembly with a wire-wound leadscrew and a spring-pin engagement of a drive nut to the leadscrew

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name

Raytheon Company

Signature

Printed name

Leonard A. Alkov

Date

November 9, 2006

Reg. No.

30,021

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature

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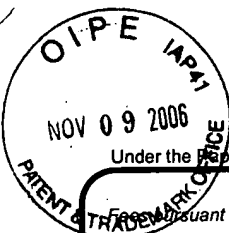
Leonard A. Alkov

Date

11-9-06

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Effective on 12/08/2004.

As required by the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL

For FY 2006

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 500.00

Complete if Known

Application Number	10/084,704
Filing Date	01/26/2002
First Named Inventor	DEVENYI, Gabor
Examiner Name	HANSEN, Colby M.
Art Unit	3682
Attorney Docket No.	01W120

METHOD OF PAYMENT (check all that apply)☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____☒ Deposit Account Deposit Account Number: 05-1335 Deposit Account Name: Raytheon Company

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, except for the filing fee☒ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☒ Credit any overpayments

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FEE CALCULATION**1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)	Multiple Dependent Claims	Fee (\$)	Fee Paid (\$)
- 20 or HP =	x	=				

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
- 3 or HP =	x	=	

HP = highest number of independent claims paid for, if greater than 3.

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
- 100 =	/ 50 =	(round up to a whole number) x	=	

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Fees Paid (\$)Other (e.g., late filing surcharge): Filing a Brief in support of an Appeal (\$500)0
500**SUBMITTED BY**

Signature	Registration No (Attorney/Agent)	30.021	Telephone	3106472577
Name (Print/Type)	Leonard A. Alkov		Date	

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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In duplicate



PD-01W120

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of)
GABOR DEVENYI) GAU: 3682
Ser. No. 10/084,704) Examiner:
Filed: February 26, 2002) Colby Hansen
For: LEADSCREW ASSEMBLY WITH A WIRE-WOUND)
LEADSCREW AND A SPRING-PIN ENGAGEMENT)
OF A DRIVE NUT TO THE LEADSCREW)

APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicant files its Appeal Brief, together with a Fee Transmittal authorizing the charging of the required fee. A Notice of Appeal and fee were previously filed.

Real party in interest

The real party in interest is the Assignee, Raytheon Company.

Related appeals and interferences

Applicant is not aware of any related appeals and/or interferences.

~~11/17/2006 JBALINAN 00000075 051335 10084704~~

~~01 FC:1402 500.00 DA~~

11/17/2006 JBALINAN 00000076 051335 10084704

01 FC:1402 500.00 DA

Status of claims

Claims 1-17 were filed. During the first round of prosecution, claims 10, 12, and 17 were amended; claim 16 was canceled; and new claims 18-21 were added. Claims "1-15" and "17-21" were finally rejected in a final Office Action dated March 8, 2004.

During the preparation of an Appeal Brief, Applicant noticed for the first time that the Examiner has not stated any ground of rejection for claims 15, 18, and 19.

Prosecution was then reopened to correct this problem and to change the grounds of rejection.

During this second round of prosecution, claims 1, 4, 10, and 21 were amended. Claims 1-15 and 17-21 were finally rejected in a Final Office Action dated June 26, 2006 (hereinafter "Final Office Action").

The appealed claims 1-15 and 17-21 are found in Appendix I.

Status of amendments

A Response to Final Office Action was filed, but it had no claim amendments.

Summary of claimed subject matter

The present invention is recited in independent claims 1, 12, and 20 and described at para. [0016]-[0021] of the Specification. The general features of the invention are illustrated in Figure 1, and details of structure are illustrated in Figures 2-3.

According to claim 1, a leadscrew assembly (20) comprises a leadscrew (22) that is operable to rotate about a rotational axis (25) to linearly drive a driven structure. The leadscrew (22) comprises an elongated shaft (40) having an outer lateral surface (40) and a rotational axis (25), and a leadscrew thread (44) comprising a thread wire (46) helically wrapped in spaced-apart turns upon the lateral surface (40) and affixed to the

elongated shaft (40). A hollow drive nut housing (26) is affixed to the driven structure and comprises a nut bore (50) having an unthreaded inner surface (52) with the leadscrew (22) being inserted through the nut bore (50). The nut bore (50) is sized such that the leadscrew (22) may rotate therein about the rotational axis (25). A spring pin (54) is affixed to the drive nut housing (26) and spans across the nut bore (50) to engage the leadscrew thread (44).

According to claim 12, a leadscrew assembly (20) comprises a leadscrew (22) comprising a cylindrical shaft (40) having an outer lateral surface (40) and a cylindrical axis coincident with a rotational axis (25) of the leadscrew (22), a leadscrew thread (44) comprising a thread wire (46) helically wrapped in spaced-apart turns upon the lateral surface (40) and affixed to the elongated shaft (40), the thread wire (46) having a circular cross section, and a spacer wire (48) having a size smaller than that of the thread wire (46) and helically interwrapped about the elongated shaft (40) with the thread wire (46) to define a spacing between the turns of the thread wire (46). A hollow drive nut housing (26) comprises a nut bore (50) having an unthreaded inner surface (52) with the leadscrew (22) being inserted through the nut bore (50). The nut bore (50) is sized such that the leadscrew (22) may rotate therein about the rotational axis (25). A spring pin (54) is affixed to the drive nut housing (26) and spans across the nut bore (50) to engage the leadscrew thread (44). The spring pin (54) has a first end (56), a central portion (58), and a second end (60). The drive nut housing (26) has a first spring pin retainer (62) therein and an oppositely disposed second spring pin retainer (64) therein. The first spring pin retainer (62) receives the first end (56) of the spring pin (54) therein, and the second spring pin retainer (64) receives the second end (60) of the spring pin (54) therein. The central portion (58) of the spring pin (54) spans in an arc across an interior of the nut bore (50) to engage the leadscrew thread (44) over a portion of a single turn. A linear slide mechanism (28) has the drive nut housing (26) affixed thereto so that the drive nut housing (26) does not rotate.

According to claim 20, a leadscrew assembly (20) comprises a leadscrew (22) comprising an elongated shaft (40) having an outer lateral surface (40) and a rotational axis (25), and a leadscrew thread (44) comprising a thread wire (46) helically wrapped

in spaced-apart turns upon the lateral surface (40) and affixed to the elongated shaft (40). A hollow drive nut housing (26) comprises a nut bore (50) having an unthreaded inner surface (52) with the leadscrew (22) being inserted through the nut bore (50). The nut bore (50) is sized such that the leadscrew (22) may rotate therein about the rotational axis (25). A spring pin (54) is affixed to the drive nut housing (26) and spans across the nut bore (50) to engage the leadscrew thread (44) over a portion of a single turn of the leadscrew thread (44). A linear slide mechanism (28) has the drive nut housing (26) affixed thereto so that the drive nut housing (26) does not rotate.

Grounds of rejection to be reviewed on appeal

Ground 1. Claims 1, 3, 5-11, and 18-21 are rejected under 35 USC 103 over Pan US Patent 6,459,844 in view of Schwanz US Patent 4,227,426.

Ground 2. Claims 1, 2, 4, 12-15, and 17 are rejected under 35 USC 103 over Pan US Patent 6,459,844 in view of Schwanz US Patent 4,227,426, and further in view of Devenyi US Patent 5,636,549.

Argument

Ground 1. Claims 1, 3, 5-11, and 18-21 are rejected under 35 USC 103 over Pan US Patent 6,459,844 in view of Schwanz US Patent 4,227,426.

Throughout the Final Office Action, elements of the references in the applied prior art are given incorrect names. To avoid confusion, Applicant will use the correct names used by the inventors in their patents. Applicant asks that the Examiner do this as well in the Reply Brief.

Schwanz is not properly applied as a reference under 35 USC 103

Schwanz teaches an technology that is so diametrically opposed to that of the present claims, and achieves a completely different result, that a person of ordinary skill in the art would not look to Schwanz for teachings to reach the presently claimed invention.

The analysis follows.

A. Schwanz is nonanalogous art

The present claims recite a leadscrew that rotates about its longitudinal rotational axis.

Schwanz discloses a device that pushes or pulls a wire along parallel to its longitudinal axis without rotating the wire. See the title of Schwanz ("Device for Longitudinal Displacement of a Flexible Drive Wire"), last sentence of Abstract of Schwanz, Background col. 1, lines 6-8, col. 2, lines 37-39, and claim 1 at col. 3, lines 8-9. In the apparatus of Schwanz, "...the arm 8...pushes or pulls the wire 1 through the hollow shaft 6, depending upon the direction of rotation of the motor 5. In order to assure that the wire 1 is actually displaced longitudinally, and not simply rotated..." (col. 2, lines 33-37).

This point is important, because of the different result achieved by Schwanz as compared with the presently claimed invention. The presently claimed invention causes its leadscrew to rotate about its longitudinal rotational axis, while Schwanz causes its wire to be pushed or pulled longitudinally with no rotation.

Contrary to the assertion of the Final Office Action at page 2, line 22, Schwanz does not "disclose...a cylindrical elongated shaft having...a rotational axis." [emphasis added] The mechanism of Schwanz is not a screw assembly or a leadscrew, but instead is a device for pushing or pulling the drive wire 1 along its length without rotating the drive wire 1. The wire coil 3 and drive wire 1 do not rotate relative to the longitudinal axis of the wire 1, which would be the result if the drive wire 1 were acting as a leadscrew. The Final Office Action at page 2, line 20 mischaracterizes the device of

Schwanz as a “screw assembly”, but Schwanz never calls it that and does not use the term “screw” at all. Schwanz’s device is a “device for longitudinal displacement of a flexible drive wire”, see title of Schwanz. To call the device of Schwanz a “screw mechanism” is both contrary to Schwanz’s own usage and an attempt to give a misimpression that the device of Schwanz acts in the manner of a leadscrew.

Schwanz is therefore nonanalogous art. Stated alternatively, Schwanz is not within the scope and content of the prior art that may be used in forming a sec. 103 rejection. To be analogous art and properly used in forming a sec. 103 rejection, a reference must be concerned with the same problem as another reference and the claims which are being addressed. See, for example, Medtronic, Inc. v. Cardiac Pacemaker, Inc., 220 USPQ 97, 104 (Fed. Cir. 1983), stating: "Faced with a rate-limiting problem, one of ordinary skill in the art would look to the solutions of others faced with rate-limiting problems."

In the present case, the inventor was concerned with a problem in improving the performance of leadscrew assemblies. The title is to a “Leadscrew Assembly...”. The Background discusses leadscrews generally and the problems associated with some leadscrews. The first sentence in the Summary of the Invention of the present application begins: “The present invention provides a leadscrew assembly...” Every pending claim recites a “leadscrew assembly”. In a leadscrew assembly, the leadscrew is rotationally driven, as presently recited in all of the claims. Consistent with the common usage in the art and as stated in para. [0010] of the present application, “The assembly typically further includes a motor that rotationally drives the leadscrew...”. See also the present claims 1, 9, 12, 15, 19, and 20, all of which recite rotation of the leadscrew.

Although the explanation of the rejection in the Final Office Action asserts that “Schwanz...discloses a screw assembly comprising...a cylindrical elongated shaft having a rotational axis...”, that is not the case. Schwanz does not disclose or teach a leadscrew assembly, wherein the leadscrew is rotationally driven or has a rotational axis. In fact, Schwanz takes great care to emphasize that its drive wire 1 is not rotated and describes the structure that prevents rotation. Schwanz states at col. 2, lines 37-45,

"In order to assure that the wire 1 is actually displaced longitudinally, and not simply rotated as the hollow shaft 6 and the spring clip 7 rotate, a tab (not shown) which is slidably received in the slit of the sheath may be attached to the wire 1. As the wire is driven, the tab would slide back and forth in the slit and prevent the wire 1 from rotating. Alternatively, the end of the flexible wire may be attached non-rotationally to the component being driven back and forth." [emphasis added]

Schwanz is therefore not properly applied in rejecting the present claims.

The Final Office Action replies at page 4, lines 21-22 and mischaracterizes the field of the present invention as "screw/nut interaction". That is not the subject of the present invention. The present invention is concerned with a leadscrew assembly, not with "screw/nut interactions". Neither the present Specification nor Schwanz characterize their fields of endeavor as "screw/nut interactions" or mention "screw/nut interactions" in any way. In any event, Schwanz does not deal with "screw/nut interaction". There is no "screw" in Schwanz. The wire 1 and its coil 3 do not turn in the manner of a screw.

Teachings from Schwanz are simply not pertinent to the field of a leadscrew as recited the present claims and disclosed in the present Specification. A person of ordinary skill looking to make improvements in the field of leadscrew mechanisms would not look to the wire push/pull mechanism taught by Schwanz.

B. Schwanz teaches away from the presently claimed approach

There is another important reason that Schwanz is not properly applied as a reference to reject the present claims. Schwanz teaches away from the present approach. Schwanz teaches that the wire 1 is moved parallel to its longitudinal axis, and that it is not rotated about its longitudinal axis(col. 2, lines 37-45). In the leadscrew assembly 20 of the present approach, just the opposite happens. The leadscrew 22 is rotated about its longitudinal axis but it is not moved parallel to its longitudinal axis. Schwanz thus teaches directly away from the present approach.

It is a well-established principle of law that a prima facie case of obviousness may not properly be based on a reference which teaches away from the present invention as recited in the claims.

“A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant. In re Spinnoble, 160 USPQ 237 244 (CCPA 1969)...As “a useful general rule,”...“a reference that ‘teaches away’ can not create a prima facie case of obviousness.” In re Gurley, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994)”

The reason for this holding is self-evident. If the reference teaches away from the recited approach, there is no basis for reversing that teaching to produce a facsimile of the claimed invention, other than a pure hindsight reconstruction.

This legal principle also makes good sense. If a reference is committed to a particular approach that is directly contrary to the claim recitation, to ignore or attempt to make a fundamental change in that approach is necessarily an attempt at hindsight reconstruction.

In short, for the reasons stated above, Schwanz is not properly applied as a reference.

The combination of Pan and Schwanz
does not teach the presently claimed invention

Even if Schwanz is improperly applied in an attempt to reject the present claims, no prima facie case of obviousness is made.

MPEP 2142, under ESTABLISHING A PRIMA FACIE CASE OF

OBVIOUSNESS, provides: "To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. [citations omitted]. See MPEP para 2143-2143.03 for decisions pertinent to each of these criteria."

The first requirement of MPEP 2142 is that "there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings"

The present rejection is a sec. 103 combination rejection. It is well established that a proper sec. 103 combination rejection requires more than just finding teachings in the references of the elements recited in the claim (but which was not done here, as discussed subsequently). To reach a proper teaching of an article or process through a combination of references, there must be stated an objective motivation to combine the teachings of the references, not a hindsight rationalization in light of the disclosure of the specification being examined. MPEP 2143 and 2143.01. See also, for example, In re Fine, 5 USPQ2d 1596, 1598 (at headnote 1) (Fed.Cir. 1988), In re Laskowski, 10 USPQ2d 1397, 1398 (Fed.Cir. 1989), W.L. Gore & Associates v. Garlock, Inc., 220 USPQ 303, 311-313 (Fed. Cir., 1983), and Ex parte Levengood, 28 USPQ2d 1300 (Board of Appeals and Interferences, 1993); Ex parte Chicago Rawhide Manufacturing Co., 223 USPQ 351 (Board of Appeals 1984). As stated in In re Fine at 5 USPQ2d 1598:

"The PTO has the burden under section 103 to establish a prima facie

case of obviousness. [citation omitted] It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references."

And, at 5 USPQ2d 1600:

"One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."

Following this authority, the MPEP states that the examiner must provide such an objective basis for combining the teachings of the applied prior art. In constructing such rejections, MPEP 2143.01 provides specific instructions as to what must be shown in order to extract specific teachings from the individual references:

"Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention when there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992)."

* * * * *

"The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)."

* * * * *

"A statement that modifications of the prior art to meet the claimed invention would have been 'well within the ordinary skill of the

art at the time the claimed invention was made' because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. Ex parte Levengood, 28 USPQ2d 1300 (Bd.Pat.App.& Inter. 1993)."

Here, there is set forth no objective basis for combining the teachings of the references in the manner used by this rejection, and selecting the helpful portions from each reference while ignoring the unhelpful portions. An objective basis is one set forth in the art or which can be established by a declaration, not one that can be developed in light of the present disclosure.

Applicant cannot find any such objective basis for combining the teachings of Pan and Schwanz, because of the completely different types of mechanisms taught by the two references. Pan teaches a conventional leadscrew assembly having a follower with a nut 30 and a leadscrew that rotates about its longitudinal axis. Schwanz teaches a device for pushing or pulling a wire along its length without rotating the wire about its longitudinal axis.

The Final Office Action (page 3, lines 10-16) sets forth two asserted advantages of Schwanz that are utterly inappropriate as a basis for combining the teachings of the two references. The first asserted advantage is that set forth at col. 1, lines 44-47 of Schwanz, "The device according to the present construction is simple in construction, and is a relatively inexpensive arrangement for translating the rotary motion of the motor to the longitudinal drive motion of the wire." The element of Pan that is driven by the motor 21, specifically the lead screw 24, does not move longitudinally--it moves rotationally. Thus, the advantage set forth in Schwanz does not achieve the desired mechanical movement when there is an attempt to apply it to Pan. Simple or not, it is not operable to achieve the required result. The second asserted advantage of Schwanz is overload protection and is set forth at col. 1, lines 53-58 is described in terms of Schwanz's device--an overload on the linearly driven

drive wire 1, not between a rotating screw and a nut as argued by the Final Office Action. In any event, there is no indication that overload protection is a problem for a leadscrew, and there is no indication in either Pan or Schwanz that such a linear-drive overload device of Schwanz could be applied to a leadscrew. The argument of the Final Office Action is straightforward hindsight. If the Courts and the MPEP had meant that the requirement for an objective basis could be met simply by listing an unrelated advantage disclosed by one of the references, they would have said so. Instead they mandated that there be an objective basis to combine the teachings, and the arguments presented in the explanation of the rejection do not meet this requirement.

The Response to Arguments in the paragraph bridging pages 5-6 of the Final Office Action repeats the two asserted advantages discussed above, and asserts that In re McLaughlin is the controlling case authority. The Examiner argues (Final Office Action, page 5, lines 15-21 that "...any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See In re McLaughlin, 170 USPQ 209 (CCPA 1971)."

The first response is that the premise "any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning." That statement is not correct, and there is no support for this statement under current law.

Secondly, when first enunciated about 35 years ago, the position of In re McLaughlin might have been subject to differing interpretations. Those seeking support for rejecting patent applications could argue that the quoted language means that no motivation to combine teachings need be found in the prior art, and those seeking to gain allowance would argue to the contrary.

After In re McLaughlin was propounded, its legal principles were later explained and clarified by the Court of Appeals for the Federal Circuit, the successor to the CCPA. As stated in In re Fine, 5 USPQ2d 1596, 1599 (Fed.Cir. 1988):

Obviousness is tested by 'what the combined teachings of the references would have suggested to those of ordinary skill in the art.' In re Keller, 208 USPQ 871, 881 (CCPA 1981). But it 'cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. ACS Hosp. Sys. [cite omitted]. And 'teachings of references can be combined only if there is some suggestion or incentive to do so.' Id. Here, the prior art contains none." [emphasis in original]

The language quoted by the Federal Circuit, 'what the combined teachings of the references would have suggested to those of ordinary skill in the art,' is virtually word-for-word that relied on by the Examiner from In re McLaughlin, except that it is quoted from a 1981 decision that sets forth the same language and principles, In re Keller.

The Federal Circuit then goes on to explain that "teachings of references can be combined only if there is some suggestion or incentive to do so. Here, the prior art contains none." [First emphasis in original, second emphasis added.] The Federal Circuit has thus held that the prior art itself must contain some suggestion or incentive to combine the teachings of the references, by way of clarifying the interpretation of cases like In re McLaughlin and In re Keller.

In re Fine also states at 5 USPQ 1598:

"The PTO has the burden under section 103 to establish a prima facie case of obviousness. [citation omitted] It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references."

The arguments advanced to support this requirement in the Final Office Action were in fact drawn entirely from the present claims, because the explanation of the rejection chose to ignore the teachings of Schwanz that produced a linear drive, and

instead to adopt only the teachings of Pan that produced a rotary drive. That is pure hindsight.

This attempted combination of teachings does not meet the first requirement of MPEP 2142.

The second requirement of MPEP 2142 is that there must be a reasonable expectation of success the teachings of the references. There is no expectation of success in the combination of Pan and Schwanz for two reasons. First, MPEP 2143.01 provides that, in constructing a sec. 103 rejection, the proposed modification cannot render the prior art unsatisfactory for its intended purpose or change the principle of operation of a reference. MPEP 2143.02 requires that, in combining the teachings of two references, there must be a reasonable expectation of success in the combination. Both of these mandates would be violated in the proposed approach of combining the teachings of Pan and Schwanz. Pan deals with a leadscrew assembly, wherein the leadscrew is rotationally driven. Schwanz does not deal with a leadscrew assembly, and in Schwanz the drive wire 1 is not rotationally driven. Schwanz states at col. 2, lines 37-38, "In order to assure that the wire 1 is actually displaced longitudinally, and not simply rotated..." and goes on to describe the structure that ensures that the wire 1 is not rotated. The structures of Pan and Schwanz are mechanically incompatible--Pan selects its structure in order to achieve rotation, and Schwanz selects its structure to prevent rotation. The attempt to modify the approach of Pan with that of Schwanz, as suggested in the explanation of the rejection, would render the approach of Pan inoperable, would change the principle of operation, and would not be expected to be operable in the manner discussed by Pan.

This attempted combination of teachings does not meet the second requirement of MPEP 2142.

The third requirement of MPEP 2142 is that the prior art reference (or references when properly combined) must teach or suggest all the claim limitations. Elaborating on this point, the following principle of law applies to all sec. 103 rejections. MPEP

2143.03 provides “To establish prima facie obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).” [emphasis added] That is, to have any expectation of rejecting the claims over a single reference or a combination of references, each limitation must be taught somewhere in the applied prior art. If limitations are not found in any of the applied prior art, the rejection cannot stand. In this case, the applied prior art references clearly do not arguably teach some limitations of the claims.

Claims 1, 3

Claim 1 recites in part:

a leadscrew operable to rotate about a rotational axis...”

The explanation of the rejection asserts that the wire 1 of Schwanz corresponds to the recited “leadscrew” (Final Office Action, page 2, lines 20-22). The wire 1 of Schwanz does not rotate. Schwanz takes care to state that the wire 1 does not rotate, and describes the structure that prevents the wire 1 from rotating, see col. 2, lines 33-45.

Claim 1 further recites in part:

a leadscrew operable to rotate about a rotational axis to linearly drive a driven structure...; and

a hollow drive nut housing affixed to the driven structure and comprising

a nut bore..., and

a spring pin affixed to the drive nut housing and spanning across the nut bore to engage the leadscrew thread.” [emphasis added]

The drive nut housing is “affixed to the driven structure”. The explanation of the rejection (Office Action, page 2, last line of page) asserts that the hollow shaft 6 of Schwanz corresponds to the recited “drive nut housing”. However, as is clear from Figures 1-3 and col. 2, lines 33-45 of Schwanz, the hollow shaft 6 is not affixed to the wire 1 that is driven longitudinally by the apparatus of Schwanz. The hollow shaft 6 of Schwanz therefore cannot correspond to the recited “drive nut housing”.

The explanation of the rejection (Final Office Action, page 3, lines 4-5) argues that the spring clip 7 of Schwanz teaches the “spring pin” limitation. The spring clip 7 taught by Schwanz is not affixed to anything comparable to the recited drive nut housing. In fact the spring clip 7 of Schwanz is not part of the driven structure, which is the drive wire 1, and instead is part of the driving motor 5 and its hollow shaft 6, as clearly depicted in Figure 1 and discussed at col. 2, line 39.

Claim 1 further recites in part:

“a leadscrew thread comprising a thread wire helically wrapped in spaced-apart turns upon the lateral surface and affixed to the elongated shaft”. [emphasis added]

Neither reference has any such teaching of a leadscrew that rotates about a rotational axis, where the leadscrew thread is a helically wrapped thread wire. Pan discloses a leadscrew but not a helically wrapped thread wire. Schwanz does not disclose any threaded structure like a leadscrew that rotates about a rotational axis. In Schwanz, the helical coil 3 is wrapped around a flexible wire 2 that does not rotate (col. 2, lines 6-45).

Claim 5

Claim 5 depends from claim 1 and incorporates its limitations. Claim 1 is patentable over the applied prior art for the reasons stated earlier, and which are incorporated here. Claim 5 is therefore patentable over the applied prior art.

Claim 5 also recites in part:

“the spring pin has a first end and a second end, and wherein the first end and the second end are each affixed to the drive nut housing.”

The drive nut housing, as recited in claim 1, is “affixed to the driven structure”. The explanation of the rejection (Final Office Action, page 2, last line of page) asserts that the hollow shaft 6 of Schwanz corresponds to the recited “drive nut housing”. However, as is clear from Figures 1-3 and col. 2, lines 33-45 of Schwanz, the hollow shaft 6 is not affixed to the wire 1 that is driven longitudinally by the apparatus of Schwanz. The hollow shaft 6 of Schwanz therefore cannot correspond to the recited “drive nut housing”.

The explanation of the rejection (Final Office Action, page 3, lines 4-5) argues that the spring clip 7 of Schwanz teaches the “spring pin” limitation. The spring clip 7 taught by Schwanz is not affixed to anything comparable to the recited drive nut housing, which in turn is “affixed to the driven structure”. The spring clip 7 of Schwanz is not part of the driven structure, which is the drive wire 1, and instead is part of the driving motor 5 and its hollow shaft 6, as clearly depicted in Figure 1 of Pan and discussed at col. 2, line 39.

Claim 6

Claim 6 depends from claim 1 and incorporates its limitations. Claim 1 is patentable over the applied prior art for the reasons stated earlier, and which are incorporated here. Claim 6 is therefore patentable over the applied prior art.

Claim 6 also recites in part:

“the drive nut housing comprises a first spring pin retainer and an oppositely disposed second spring pin retainer”

The drive nut housing, as recited in claim 1, is "affixed to the driven structure". The explanation of the rejection (Final Office Action, page 2, last line of page) asserts that the hollow shaft 6 of Schwanz corresponds to the recited "drive nut housing". However, as is clear from Figures 1-3 and col. 2, lines 33-45 of Schwanz, the hollow shaft 6 is not affixed to the wire 1 that is driven longitudinally by the apparatus of Schwanz. The hollow shaft 6 of Schwanz therefore cannot correspond to the recited "drive nut housing".

The explanation of the rejection argues that the spring pin retainers are associated with the hollow shaft 6 of Schwanz (Final Office Action, page 3, lines 8-9). The hollow shaft 6 cannot be considered to be the recited "drive nut housing", because the "drive nut housing" is "affixed to the driven structure" and the hollow shaft 6 is not affixed to the driven structure. Accordingly, the argument that there are spring pin retainers associated with the hollow shaft 6 of Schwanz establishes that the spring pin retainers are not part of any drive nut housing in Schwanz.

Claim 6 further recites in part:

"the first spring pin retainer having the first end of the spring pin affixed thereto and the second spring pin retainer having the second end of the spring pin affixed thereto, with the central portion of the spring pin spanning in an arc across an interior of the nut bore to engage the leadscrew thread"

For reasons similar to those discussed above in relation to this claim 6, these limitations also cannot be met by any teaching of Pan or Schwanz.

Claim 7

Claim 7 depends from claim 1 and claim 6 and incorporates their limitations. Claims 1 and 6 are patentable over the applied prior art for the reasons stated earlier, and which are incorporated here. Claim 7 is therefore patentable over the applied prior

art.

Claim 7 also recites in part:

“the first spring pin retainer and the second spring pin retainer each comprise openings in the drive nut housing.”

The drive nut housing, as recited in claim 1, is “affixed to the driven structure”. The explanation of the rejection (Final Office Action, page 2, last line of page) asserts that the hollow shaft 6 of Schwanz corresponds to the recited “drive nut housing”. However, as is clear from Figures 1-3 and col. 2, lines 33-45 of Schwanz, the hollow shaft 6 is not affixed to the wire 1 that is driven longitudinally by the apparatus of Schwanz. The hollow shaft 6 of Schwanz therefore cannot correspond to the recited “drive nut housing”.

The explanation of the rejection argues that the spring pin retainers are associated with the hollow shaft 6 of Schwanz (Final Office Action, page 3, lines 8-9). The hollow shaft 6 cannot be considered to be the recited “drive nut housing”, because the “drive nut housing” is “affixed to the driven structure” and the hollow shaft 6 of Schwanz is not affixed to the driven structure. Accordingly, the Examiner’s argument that there are openings serving as spring pin retainers associated with the hollow shaft 6 of Schwanz establishes that the spring pin retainers are not part of any drive nut housing in Schwanz.

Claim 8

Claim 8 depends from claim 1 and incorporates its limitations. Claim 1 is patentable over the applied prior art for the reasons stated earlier, and which are incorporated here. Claim 8 is therefore patentable over the applied prior art.

Claim 8 further recites in part:

“the drive nut housing has an access opening therethrough, through

which the spring pin is accessible from an exterior of the drive nut housing and providing clearance for the spring pin.”

The drive nut housing, as recited in claim 1, is “affixed to the driven structure”. The explanation of the rejection (Final Office Action, page 2, last line of page) asserts that the hollow shaft 6 of Schwanz corresponds to the recited “drive nut housing”. However, as is clear from Figures 1-3 and col. 2, lines 33-45 of Schwanz, the hollow shaft 6 is not affixed to the wire 1 that is driven longitudinally by the apparatus of Schwanz. The hollow shaft 6 of Schwanz therefore cannot correspond to the recited “drive nut housing”.

The explanation of the rejection argues that the spring pin retainers are associated with the hollow shaft 6 of Schwanz (Final Office Action, page 3, lines 8-9). The hollow shaft 6 cannot be considered to be the recited “drive nut housing”, because the “drive nut housing” is “affixed to the driven structure” and the hollow shaft 6 of Schwanz is not affixed to the driven structure. Accordingly, the Examiner’s argument that there are openings serving as spring pin retainers associated with the hollow shaft 6 of Schwanz establishes that the spring pin retainers are not part of any drive nut housing in Schwanz.

Claim 9

Claim 9 depends from claim 1 and incorporates its limitations. Claim 1 is patentable over the applied prior art for the reasons stated earlier, and which are incorporated here. Claim 9 is therefore patentable over the applied prior art.

Claim 9 further recites in part:

“a motor that rotationally drives the leadscrew”.

The explanation of the rejection does not address this limitation. Applicant believes that the explanation of the rejection (Office Action, page 2, line 18-page 3, line

9 means to indicate that the teaching relied upon is that of Schwanz. Schwanz teaches that the wire 1 is linearly driven along its longitudinal axis, not rotationally driven. The motor of Schwanz therefore does not “rotationally drive the leadscrew”.

Claim 10

Claim 10 depends from claim 1 and incorporates its limitations. Claim 1 is patentable over the applied prior art for the reasons stated earlier, and which are incorporated here. Claim 10 is therefore patentable over the applied prior art.

Claim 10 further recites in part:

“a linear slide mechanism to which the drive nut housing is affixed so that the drive nut housing does not rotate.”

The explanation of the rejection argues that Pan teaches a nut 30 (Final Office Action, page 2, line 15), which does not rotate, and that Schwanz teaches a hollow shaft 6 (Final Office Action, page 2, last line on page), which does rotate. The explanation of the rejection seeks to combine the teachings of the two references, but does not explain how a person of ordinary skill in the art is to decide whether to adopt Pan’s teaching of the nut 30 that does not rotate, or to adopt Schwanz’s teaching of the hollow shaft 6 that does rotate.

It would appear, however, that the choice of the Final Office Action is to adopt Schwanz’s hollow shaft 6, that does rotate: “It would have been obvious...to have utilized the hollow nut [sic, shaft]...as taught by Schwanz” (Final Office Action, page 3, lines 10-12). In that case, the adopted teaching of the hollow shaft 6 means that the feature of the combined teachings that is said to mimic the recited “drive nut housing” does rotate, contrary to the recitation of claim 10. Schwanz thus teaches directly away from the present claim limitations.

Claim 11

Claim 11 depends from claim 1 and claim 10 and incorporates their limitations. Claims 1 and 10 are patentable over the applied prior art for the reasons stated earlier, and which are incorporated here. Claim 11 is therefore patentable over the applied prior art.

Claim 11 further recites in part:

“an optical filter supported on the linear slide mechanism, the optical filter being movable by a rotation of the leadscrew.” [emphasis added]

Schwanz teaches that the movable element is driven by longitudinal motion without any rotation (Schwanz, col. 2, lines 33-45). By adopting the teachings of Schwanz (Final Office Action, page 3, lines 10-12) regarding this structure and combining them with the teachings of Pan, the rejection asserts that the driven structure is moved by a pure longitudinal movement of the wire 1 of Schwanz, without any rotation at all. This teaching is directly contrary to the recitation of claim 11.

Claim 18

Claim 18 depends from claim 1 and incorporates its limitations. Claim 1 is patentable over the applied prior art for the reasons stated earlier, and which are incorporated here. Claim 18 is therefore patentable over the applied prior art.

Claim 18 further recites in part:

“the spring pin contacts the leadscrew thread over a portion of a single turn.”

The explanation of the rejection asserts that the spring clip 7 of Schwanz corresponds to the recited “spring pin”. The spring clip 7 of Schwanz contacts the helical coil 3 of Schwanz, and does not contact a leadscrew thread at all. The helical

coil 3 of Schwanz does not rotate, because it is wound onto the non-rotating wire 1 (Schwanz col. 2, lines 33-45), and therefore does not correspond to the recited “leadscrew thread”.

Claim 19

Claim 19 depends from claim 1 and incorporates its limitations. Claim 1 is patentable over the applied prior art for the reasons stated earlier, and which are incorporated here. Claim 19 is therefore patentable over the applied prior art.

Claim 19 further recites in part:

“the spring pin is preloaded to ensure a positive contact between the spring pin and the leadscrew thread when a rotational direction of the leadscrew is reversed”. [emphasis added]

Neither reference teaches a preloading, and the explanation of the rejection does not mention this limitation or assert that there is any such teaching in the references.

Claims 20, 21

Claim 20 has some limitations in common with claim 1. The prior discussion of claim 1 is incorporated herein.

Claim 20 recites in part:

“a leadscrew comprising...
a hollow drive nut housing comprising
a nut bore having an unthreaded inner surface with the
leadscrew being inserted through the nut bore, the nut bore being sized
such that the leadscrew may rotate therein about the rotational axis, and
a spring pin affixed to the drive nut housing and spanning

across the nut bore to engage the leadscrew thread over a portion of a single turn of the leadscrew thread;”

The spring clip 7 taught by Schwanz is not affixed to anything comparable to the recited drive nut housing. The spring clip 7 of Schwanz is not part of the driven structure, which is the drive wire 1, and instead is part of the driving motor 5 and its hollow shaft 6, as clearly depicted in Figure 1 and discussed at col. 2, line 39.

Claim 20 further recites in part:

“a leadscrew comprising
an elongated shaft having an outer lateral surface and a rotational axis, and
a leadscrew thread comprising a thread wire helically wrapped in spaced-apart turns upon the lateral surface and affixed to the elongated shaft”.

Neither reference has any such teaching of a leadscrew that rotates about a rotational axis, where the leadscrew thread is a helically wrapped thread wire. Pan discloses a leadscrew but not a helically wrapped thread wire. Schwanz does not disclose any threaded structure like a leadscrew that rotates about a rotational axis.

This attempted combination of teachings does not meet the third requirement of MPEP 2142.

The Final Office Action does not address this third requirement at all, or seek to controvert Applicant’s position.

Ground 2. Claims 1, 2, 4, 12-15, and 17 are rejected under 35 USC 103 over Pan US Patent 6,459,844 in view of Schwanz US Patent 4,227,426, and further in view of Devenyi US Patent 5,636,549.

The Ground 2 rejection is based upon the same two references, Pan and Schwanz, used in the Ground 1 rejection, plus Devenyi '549. Applicant incorporates the prior Ground 1 discussion as applied to the claims rejected under Ground 2. Schwanz is not properly applied to reject the claims for the reasons discussed under Ground 1. Pan and Schwanz are not properly combined, and, even if combined, do not teach the claim limitations for the reasons discussed under Ground 1. Devenyi adds nothing in this regard.

The combination of Pan, Schwarz, and Devenyi '549 does not teach the presently claimed invention

The first requirement of MPEP 2142 is that "there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings". Applicant incorporates the prior argument regarding the attempt to combine Pan and Schwanz. As to Devenyi '549, the explanation of the rejection asserts that the reason for combining the teachings of Devenyi '549 with those of Pan is "to form a hard, smooth thread comprising a wear-resistant running surface for engagement with a bearing nut member" (Final Office Action, page 4, lines 9-13), an argument based upon an advantage drawn from the Abstract of Devenyi '549. While this is certainly an advantage for the device of Devenyi '549, it is not a reason to modify the structure taught by Pan with the structure taught by Devenyi '549. For this argument to have any weight, it would have to be shown that Pan does not have leadscrew threads that are hard and smooth. Pan never complains that the machined threads of its leadscrew 24 fail to provide a hard, smooth surface. Conventional leadscrew shafts, like those of Pan, are produced to provide a hard, smooth thread surface. There is no

reason to substitute the approach of Devenyi '549 for that of Pan. If the Courts and the MPEP had meant that the requirement for an objective basis could be met simply by listing an unrelated advantage disclosed by one of the references, they would have said so. Instead they mandated that there be an objective basis to combine the teachings, and the arguments presented in the explanation of the rejection do not meet this requirement.

This attempted combination of teachings does not meet the first requirement of MPEP 2142.

The second requirement of MPEP 2142 is that there must be a reasonable expectation of success the teachings of the references. MPEP 2143.01 provides that, in constructing a sec. 103 rejection, the proposed modification cannot render the prior art unsatisfactory for its intended purpose or change the principle of operation of a reference. MPEP 2143.02 requires that, in combining the teachings of two references, there must be a reasonable expectation of success in the combination. Both of these mandates would be violated in the proposed approach of combining the teachings of Pan, Schwanz and Devenyi '549. Pan and Devenyi '549 deal with leadscrew assemblies, wherein the leadscrew is rotationally driven. Schwanz does not deal with a leadscrew assembly, and in Schwanz the drive wire 1 is not rotationally driven. Schwanz states at col. 2, lines 37-38, "In order to assure that the wire 1 is actually displaced longitudinally, and not simply rotated..." and goes on to describe the structure that assures that the wire 1 is not rotated. The structures of Pan, Schwanz, and Devenyi '549 are mechanically incompatible. The attempt to modify the approach of Pan and Devenyi '549 with that of Schwanz, as suggested in the explanation of the rejection, would render the approach of Pan and Devenyi '549 inoperable, would change the principle of operation, and would not be expected to be operable in the manner discussed by Pan.

This attempted combination of teachings does not meet the second requirement of MPEP 2142.

The third requirement of MPEP 2142 is that the prior art reference (or references

when properly combined) must teach or suggest all the claim limitations.

The explanation of the rejection implicitly refers back to the discussion of the Pan and Schwanz references in the Ground 1 rejection (Final Office Action, paragraph bridging pages 3-4. Applicant will also refer back to that source in the following discussion.

Claims 1, 2, 4

Claim 1 recites in part:

a leadscrew operable to rotate about a rotational axis to linearly drive a driven structure...; and

The explanation of the rejection asserts that the wire 1 of Schwanz corresponds to the recited “leadscrew” (Final Office Action, page 2, lines 20-22). The wire 1 of Schwanz does not rotate. It is not a leadscrew and does not have a rotational axis. Schwanz takes care to state that the wire 1 does not rotate, and describes the structure that prevents the wire 1 from rotating, see col. 2, lines 33-45.

Claim 1 further recites in part:

a hollow drive nut housing affixed to the driven structure and comprising

a nut bore..., and

a spring pin affixed to the drive nut housing and spanning across the nut bore to engage the leadscrew thread.” [emphasis added]

The drive nut housing is “affixed to the driven structure”. The explanation of the rejection (Office Action, page 2, last line of page) asserts that the hollow shaft 6 of Schwanz corresponds to the recited “drive nut housing”. However, as is clear from Figures 1-3 and col. 2, lines 33-45 of Schwanz, the hollow shaft 6 is not affixed to the

wire 1 that is driven longitudinally by the apparatus of Schwanz. The hollow shaft 6 of Schwanz therefore cannot correspond to the recited "drive nut housing".

The explanation of the rejection (Final Office Action, page 3, lines 4-5) argues that the spring clip 7 of Schwanz teaches the "spring pin" limitation. The spring clip 7 taught by Schwanz is not affixed to anything comparable to the recited drive nut housing. In fact the spring clip 7 of Schwanz is not part of the driven structure, which is the drive wire 1, and instead is part of the driving motor 5 and its hollow shaft 6, as clearly depicted in Figure 1 and discussed at col. 2, line 39.

Devenyi '549 teaches directly away from this recitation. Devenyi teaches an angled-bearing follower arrangement illustrated in Figure 4 and discussed at col. 4, lines 22-56. If the teachings of Devenyi '549 are to be combined with those of Pan, then the follower that would be used is the angled-bearing arrangement, not a spring pin as recited in claim 1. Devenyi '549 may not be used to reject the present claims. It is a well-established principle of law that a *prima facie* case of obviousness may not properly be based on a reference which teaches away from the present invention as recited in the claims.

"A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant. In re Spinnoble, 160 USPQ 237 244 (CCPA 1969)...As "a useful general rule,"..."a reference that 'teaches away' can not create a prima facie case of obviousness." In re Gurley, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994)"

If one were to follow the teachings of Devenyi '549, the angled-bearing follower arrangement would necessarily be used, not the spring-pin structure recited in the present claims.

Claim 1 further recites in part:

“a leadscrew thread comprising a thread wire helically wrapped in spaced-apart turns upon the lateral surface and affixed to the elongated shaft”. [emphasis added]

The combination of the teachings of Pan and Schwanz is relied upon for this teaching. Neither reference has any such teaching of a leadscrew that rotates about a rotational axis, where the leadscrew thread is a helically wrapped thread wire. Pan discloses a leadscrew but not a helically wrapped thread wire. Schwanz does not disclose any threaded structure like a leadscrew that rotates about a rotational axis. In Schwanz, the helical coil 3 is wrapped around a flexible wire 2 that does not rotate (col. 2, lines 6-45).

This attempted combination of teachings does not meet the third requirement of MPEP 2142.

Claim 12

Independent claim 12 recites in part:

“a leadscrew comprising
a cylindrical shaft having an outer lateral surface and a
cylindrical axis coincident with a rotational axis of the leadscrew”

The explanation of the rejection asserts that the wire 1 of Schwanz corresponds to the recited “leadscrew” (Final Office Action, page 2, lines 20-22). The wire 1 of Schwanz does not rotate. It is not a leadscrew and does not have a rotational axis. Schwanz takes care to state that the wire 1 does not rotate, and describes the structure that prevents the wire 1 from rotating, see col. 2, lines 33-45.

Claim 12 further recites in part:

“a hollow drive nut housing comprising

a nut bore having an unthreaded inner surface with the leadscrew being inserted through the nut bore, the nut bore being sized such that the leadscrew may rotate therein about the rotational axis," [emphasis added]

The explanation of the rejection (Office Action, page 2, last five lines of page) asserts that the hollow shaft 6 of Schwanz corresponds to the recited "drive nut housing", and that the wire 1 corresponds to the recited leadscrew. However, as is clear from Figures 1-3 and col. 2, lines 33-45 of Schwanz, it is the hollow shaft 6 of Schwarz that rotates, not the wire 1. Accordingly, Schwarz cannot teach that the leadscrew rotates within the nut bore about the leadscrew's rotational axis. The hollow shaft 6 of Schwanz therefore cannot correspond to the recited "drive nut housing".

Claim 12 further recites in part:

"a spring pin affixed to the drive nut housing and spanning across the nut bore to engage the leadscrew thread,

wherein the spring pin has a first end, a central portion, and a second end, and

wherein the drive nut housing has a first spring pin retainer therein and an oppositely disposed second spring pin retainer therein, the first spring pin retainer receiving the first end of the spring pin therein and the second spring pin retainer receiving the second end of the spring pin therein, with the central portion of the spring pin spanning in an arc across an interior of the nut bore to engage the leadscrew thread over a portion of a single turn;"

The explanation of the rejection (Final Office Action, page 3, lines 4-5) argues that the spring clip 7 of Schwanz teaches the "spring pin" limitation. The spring clip 7 taught by Schwanz is not affixed to anything comparable to the recited drive nut housing. In fact the spring clip 7 of Schwanz is not part of the driven structure, which is the drive wire 1, and instead is part of the driving motor 5 and its hollow shaft 6, as

clearly depicted in Figure 1 and discussed at col. 2, line 39.

Claim 12 further recites in part:

“a linear slide mechanism to which the drive nut housing is affixed so that the drive nut housing does not rotate.”

Schwanz teaches that the structure analogized to the drive nut housing, the hollow shaft 6, is affixed to the motor, not to any linear slide mechanism (col. 2, lines 8-9). Thus, none of the three applied references teaches a leadscrew assembly having a drive nut housing with a spring pin, wherein the drive nut housing is affixed to the linear slide mechanism. In addition to the fact that Schwanz does not teach a leadscrew, Schwanz places the structure relied upon in forming the rejection at the motor end, not at any linear slide mechanism end (and in fact Schwanz has no linear slide mechanism). The structure of the proposed combination of teachings seeks to move the mechanism of Schwanz to a location completely different from that taught by Schwanz, and to apply it in a completely different context from that taught by Schwanz, a rotating leadscrew.

Claim 13

Claim 13 depends from claim 12 and incorporates its limitations. Claim 12 is patentable over the applied prior art for the reasons stated earlier, and which are incorporated here. Claim 13 is therefore patentable over the applied prior art.

Claim 13 further recites in part:

“the first spring pin retainer and the second spring pin retainer each comprise openings in the drive nut housing”

The explanation of the rejection argues that the spring pin retainers are

associated with the hollow shaft 6 of Schwanz (Final Office Action, page 3, lines 8-9). The hollow shaft 6 cannot be considered to be the recited "drive nut housing", because the "drive nut housing" is affixed to the linear slide mechanism (last clause of claim 12), and the hollow shaft 6 of Schwanz is not affixed to a linear slide mechanism. Accordingly, the Examiner's argument that there are openings serving as spring pin retainers associated with the hollow shaft 6 of Schwanz establishes that the spring pin retainers are not part of any drive nut housing in Schwanz.

The combination of references cannot teach the limitations of claim 13.

Claim 14

Claim 14 depends from claim 12 and incorporates its limitations. Claim 12 is patentable over the applied prior art for the reasons stated earlier, and which are incorporated here. Claim 14 is therefore patentable over the applied prior art.

Claim 14 further recites in part:

"the drive nut housing has an access opening therethrough, through which the spring pin is accessible from an exterior of the drive nut housing and providing clearance for the spring pin."

The drive nut housing, as recited in the last clause of claim 12, is affixed to the linear slide mechanism. The explanation of the rejection (Final Office Action, page 2, last line of page) asserts that the hollow shaft 6 of Schwanz corresponds to the recited "drive nut housing". However, as is clear from Figures 1-3 and col. 2, lines 33-45 of Schwanz, the hollow shaft 6 is not affixed to the wire 1 that is driven longitudinally by the apparatus of Schwanz. The hollow shaft 6 of Schwanz therefore cannot correspond to the recited "drive nut housing".

The explanation of the rejection argues that the spring pin retainers are associated with the hollow shaft 6 of Schwanz (Final Office Action, page 3, lines 8-9). The hollow shaft 6 cannot be considered to be the recited "drive nut housing", because

the “drive nut housing” is not affixed to any linear slide mechanism, and the hollow shaft 6 of Schwanz is not affixed to the driven structure. Accordingly, the Examiner’s argument that there are openings serving as spring pin retainers associated with the hollow shaft 6 of Schwanz establishes that the spring pin retainers are not part of any drive nut housing in Schwanz.

The combination of references cannot teach the limitations of claim 14.

Claim 15

Claim 15 depends from claim 12 and incorporates its limitations. Claim 12 is patentable over the applied prior art for the reasons stated earlier, and which are incorporated here. Claim 15 is therefore patentable over the applied prior art.

Claim 15 further recites in part:

“a motor that rotationally drives the leadscrew”.

The explanation of the rejection does not address this limitation. Applicant believes that the explanation of the rejection (Office Action, page 2, line 18-page 3, line 9 means to indicate that the teaching relied upon is that of Schwanz. Schwanz teaches that the wire 1 is linearly driven along its longitudinal axis, not rotationally driven. The motor of Schwanz therefore does not “rotationally drive the leadscrew”.

Claim 17

Claim 17 depends from claim 12 and incorporates its limitations. Claim 12 is patentable over the applied prior art for the reasons stated earlier, and which are incorporated here. Claim 17 is therefore patentable over the applied prior art.

Claim 17 further recites in part:

“an optical filter supported on the linear slide mechanism, the

optical filter being movable by a rotation of the leadscrew." [emphasis added]

Schwanz teaches that the movable element is driven by longitudinal motion without any rotation (Schwanz, col. 2, lines 33-45). By adopting the teachings of Schwanz (Final Office Action, page 3, lines 10-12) regarding this structure and combining them with the teachings of Pan, the rejection asserts that the driven structure is moved by a pure longitudinal movement of the wire 1 of Schwanz, without any rotation at all. This teaching is directly contrary to the recitation of claim 17.

The combination of references cannot teach the limitations of claim 17.

SUMMARY AND CONCLUSION

Both grounds of rejection are based in an attempt to combine the teachings of Pan and Schwanz (with Devenyi '549 added in the Ground 2 rejection).

The attempt to combine these teachings fails because Schwanz goes in an entirely different direction than Pan. Pan teaches a rotational leadscrew and follower. Schwanz teaches a rotating motor that pulls or pushes a nonrotating wire parallel to its longitudinal axis. The explanations of the rejections tries to analogize Schwanz's nonrotating wire as a rotating leadscrew, and it isn't. This error leads to numerous instances in which the specific recitations of the present claims are not taught by the combination of references.

Applicant asks that the Board reverse the rejections.

Respectfully submitted,



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APPENDIX I
Claims Involved in the Appeal

1. A leadscrew assembly comprising:
a leadscrew operable to rotate about a rotational axis to linearly drive a driven structure and comprising
an elongated shaft having an outer lateral surface and a rotational axis,
and
a leadscrew thread comprising a thread wire helically wrapped in spaced-apart turns upon the lateral surface and affixed to the elongated shaft; and
a hollow drive nut housing affixed to the driven structure and comprising
a nut bore having an unthreaded inner surface with the leadscrew being inserted through the nut bore, the nut bore being sized such that the leadscrew may rotate therein about the rotational axis, and
a spring pin affixed to the drive nut housing and spanning across the nut bore to engage the leadscrew thread.
2. The assembly of claim 1, wherein the leadscrew further comprises
a spacer wire having a size smaller than that of the thread wire and helically interwrapped about the elongated shaft with the thread wire.
3. The assembly of claim 1, wherein the elongated shaft is cylindrical.
4. The assembly of claim 1, wherein the thread wire has a circular cross section.
5. The assembly of claim 1, wherein the spring pin has a first end and a second end, and wherein the first end and the second end are each affixed to the drive nut housing.

6. The assembly of claim 1, wherein the spring pin has a first end, a central portion, and a second end, and wherein the drive nut housing comprises a first spring pin retainer and an oppositely disposed second spring pin retainer, the first spring pin retainer having the first end of the spring pin affixed thereto and the second spring pin retainer having the second end of the spring pin affixed thereto, with the central portion of the spring pin spanning in an arc across an interior of the nut bore to engage the leadscrew thread.

7. The assembly of claim 6, wherein the first spring pin retainer and the second spring pin retainer each comprise openings in the drive nut housing.

8. The assembly of claim 1, wherein the drive nut housing has an access opening therethrough, through which the spring pin is accessible from an exterior of the drive nut housing and providing clearance for the spring pin.

9. The assembly of claim 1, further including a motor that rotationally drives the leadscrew.

10. The assembly of claim 1, wherein the driven structure includes a linear slide mechanism to which the drive nut housing is affixed so that the drive nut housing does not rotate.

11. The assembly of claim 10, further including an optical filter supported on the linear slide mechanism, the optical filter being movable by a rotation of the leadscrew.

12. A leadscrew assembly comprising:
a leadscrew comprising
a cylindrical shaft having an outer lateral surface and a cylindrical axis coincident with a rotational axis of the leadscrew,

a leadscrew thread comprising a thread wire helically wrapped in spaced-apart turns upon the lateral surface and affixed to the elongated shaft, the thread wire having a circular cross section, and

a spacer wire having a size smaller than that of the thread wire and helically interwrapped about the elongated shaft with the thread wire to define a spacing between the turns of the thread wire;

a hollow drive nut housing comprising

a nut bore having an unthreaded inner surface with the leadscrew being inserted through the nut bore, the nut bore being sized such that the leadscrew may rotate therein about the rotational axis, and

a spring pin affixed to the drive nut housing and spanning across the nut bore to engage the leadscrew thread,

wherein the spring pin has a first end, a central portion, and a second end, and

wherein the drive nut housing has a first spring pin retainer therein and an oppositely disposed second spring pin retainer therein, the first spring pin retainer receiving the first end of the spring pin therein and the second spring pin retainer receiving the second end of the spring pin therein, with the central portion of the spring pin spanning in an arc across an interior of the nut bore to engage the leadscrew thread over a portion of a single turn; and

a linear slide mechanism to which the drive nut housing is affixed so that the drive nut housing does not rotate.

13. The assembly of claim 12, wherein the first spring pin retainer and the second spring pin retainer each comprise openings in the drive nut housing.

14. The assembly of claim 12, wherein the drive nut housing has an access opening therethrough, through which the spring pin is accessible from an exterior of the drive nut housing and providing clearance for the spring pin.

15. The assembly of claim 12, further including
a motor that rotationally drives the leadscrew about the rotational axis.
17. The assembly of claim 12, further including
an optical filter supported on the linear slide mechanism, the optical filter being
movable by a rotation of the leadscrew.
18. The assembly of claim 1, wherein
the spring pin contacts the leadscrew thread over a portion of a single turn.
19. The assembly of claim 1, wherein the spring pin is preloaded to ensure
a positive contact between the spring pin and the leadscrew thread when a rotational
direction of the leadscrew is reversed.
20. A leadscrew assembly comprising:
a leadscrew comprising
an elongated shaft having an outer lateral surface and a rotational axis,
and
a leadscrew thread comprising a thread wire helically wrapped in spaced-
apart turns upon the lateral surface and affixed to the elongated shaft;
a hollow drive nut housing comprising
a nut bore having an unthreaded inner surface with the leadscrew being
inserted through the nut bore, the nut bore being sized such that the leadscrew may
rotate therein about the rotational axis, and
a spring pin affixed to the drive nut housing and spanning across the nut
bore to engage the leadscrew thread over a portion of a single turn of the leadscrew
thread; and
a linear slide mechanism to which the drive nut housing is affixed so that the
drive nut housing does not rotate.

21. The assembly of claim 20, further including
an optical filter supported on the linear slide mechanism, the optical filter being
movable by a rotation of the leadscrew.

APPENDIX II

Evidence Entered and Relied Upon in the Appeal

None

APPENDIX III

Related Proceedings

Applicant is not aware of any related proceedings.